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Payload Ground Processing Safety at KSC (Shuttle)

IAASS

INTERNATIONAL ASSOCIATION FOR THE ADVANCEMENT OF SPACE SAFETY



Applicable Documents



- Ground Safety Requirements
 - KHB 1700.7 “Payload Ground Safety Handbook” (KNPR 8715.2)
- Ground Safety Processes
 - NSTS 13830 “Payload Safety review and Data Submittal Requirements”
 - SSP 30599 “Safety Review Process”



How Is Compliance Verified?



- Phase Safety Review Process
 - Described in NSTS 13830/SSP 30599
 - Phase safety reviews are conducted by a panel of representatives from many different backgrounds to provide spectrum of knowledge on the subject of safety. The task of the panel is verify that the payload and its support equipment comply with requirements.



Types of Meetings



- Types of Meetings
 - By Mail
 - Most common (90+%)
 - Exchange of comments via letter
 - Telecon
 - Least common
 - Useful in short turnaround situations
 - Face-To-Face



Scheduling



- Program requirements (13830/30599) state that a review will be held **45** days after the receipt of an acceptable package.
- Phase III must be completed 30 days prior to H/W (including GSE) arrival.
- It is **PO's** responsibility to complete process.
- Just give us a call.



Ground Safety Data Packages



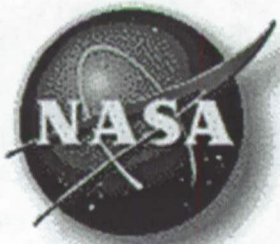
- Packages should be commensurate with the level of hazard presented by the payload
- Packages can be from one page to five volumes plus the Certificate of Compliance
- Follow NSTS 13830/SSP 30599
 - On-dock dates are critical
- Pre-Phase III and Delta Phase III Safety Assessments



Ground Safety Package Matrices



- Pressurized Ground Support Equipment
- Mechanical Ground Support Equipment
- Hazard Controls
- Available via GSRP Website



SVTL and Ground Operations Constrained



From the Instructions for JSC Form 764:

GROUND OPERATIONS CONSTRAINED

For Flight SVTLs:

Indicate “yes” or “no” as to whether this safety verification constrains any ground operations. If “yes”, provide an attachment that identifies which ground operation is constrained. Notification to the Ground Safety Review Panel of the constraint shall be provided by the PO.

For Ground SVTLs:

Indicate which ground operation is constrained by this verification. Indication may be specific (e.g. a step in a procedure) or general (e.g. arrival or first use). *{Yes and No are **NOT** acceptable entries.}*



Flight H/W Issues in the Ground Environment



- Graphite-Epoxy Composite Overwrapped Pressure Vessel (COPV)
 - Ground concerns with unseen damage
 - Codified in KNPR 8715.3, Annex E, Appendix B
 - Revision to AIAA Standard (S-081) in work
 - Must be addressed in Safety Data Package



Flight H/W Issues in the Ground Environment



- Hazardous Materials
 - Material Safety Data Sheets
 - Flight Samples
 - Must provide list
 - Proprietary
 - Approval/submittal to JSC is not sufficient
 - Ionizing/Non-Ionizing Radiation



Ground Processing Issues - Plastics, Foams and Adhesives (PFA)



- All PFAs must be approved for use in their particular application.
- List of materials that have been tested is available on the GSRP Website
- If not already approved for planned use or has not been tested, must have a valid MUA.



Ground Processing Issues - Operating Procedures



- KSC policy that payload ground operations are conducted using written procedures.
- Reviewed for:
 - Specific safety requirements contained in KHB 1700.7, Appendix C.
 - Procedure controls identified in the payload hazard reports.



Ground Processing Issues



- Commercial Off The Shelf (COTS) Equipment
 - A lot of GSE, especially Electrical GSE, is now COTS
 - Design review is not necessary as long as the PO certifies they are using the COTS in the manner it was manufactured for and they have not modified it.



Ground Processing Issues



- Government Furnished and Other Programs' GSE
 - For these items, the PO is expected to certify that they will only use the equipment in the manner for which it was designed and will not modify it.



Ground Processing Issues



- Government Furnished Equipment/
Contractor Furnished Equipment/
Government Furnished Cargo
 - Everything from nuts, bolts and underwear to lasers, hazardous materials and radioactive sources
 - Use “Certification for Ground Safety Review of Basic Hardware or Government Furnished Equipment (GFE)” form



Ground Processing Issues



- Non-Compliance Reports (NCRs)
 - Used when compliance with KHB 1700.7 can not be met.
 - Includes meets intent.
 - If the NCR does not impact flight hardware design, flight operations or flight safety, approval has been delegated to the Chairman, GSRP, with concurrence from the Flight Chairman.



Ground Processing Issues



- Mishaps
 - Very broadly defined as an unplanned event in KHB 1700.7, Section 5.
 - All mishaps must be reported to the Launch Site Safety Office (5.3.1)
 - This does not relieve the PO from the requirements levied by NASA HQ for mishap reporting.



Contact Information



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